



SEQUENCE LISTING

<110> Frank B. Gertler
James E. Bear
Jurgen Wehland
Joseph Loureiro

<120> Methods and Products for Regulating Cell
Motility

<130> M00656.70064.US

<140> 09/823,240

<141> 2001-04-03

<150> 60/194,564

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<212> PRT

<213> Listeria monocytogenes

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<222> (1)...(1)

<223> Xaa is Asp or Glu

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<223> Xaa is any amino acid

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35 40 45
Val Gly Arg Lys Ile Gln Asp His Gln Val Val Ile Asn Cys Ala Ile
50 55 60
Pro Lys Gly Leu Lys Tyr Asn Gln Ala Thr Gln Thr Phe His Gln Trp
65 70 75 80
Arg Asp Ala Arg Gln Val Tyr Gly Leu Asn Phe Gly Ser Lys Glu Asp

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Ser	Gln	Glu	Ala	Ala	Gln	Ser	Lys	Val	Thr	Ala	Thr	Gln	Asp	Ser	Thr	
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Asn	Leu	Arg	Cys	Ile	Phe	Cys	Gly	Pro	Thr	Leu	Pro	Arg	Gln	Asn	Ser	
130				135				140								
Gln	Leu	Pro	Ala	Gln	Val	Gln	Asn	Gly	Pro	Ser	Gln	Glu	Glu	Leu	Glu	
145					150				155				160			
Ile	Gln	Arg	Arg	Gln	Leu	Gln	Glu	Gln	Gln	Arg	Gln	Lys	Glu	Leu	Glu	
165				170				175								
Arg	Glu	Arg	Met	Glu	Arg	Glu	Arg	Leu	Glu	Arg	Glu	Arg	Leu	Glu	Arg	
180				185				190								
Glu	Arg	Leu	Glu	Arg	Glu	Arg	Leu	Glu	Gln	Glu	Gln	Leu	Glu	Arg	Gln	
195				200				205								
Arg	Gln	Glu	Arg	Glu	His	Val	Glu	Arg	Leu	Glu	Arg	Glu	Arg	Leu	Glu	
210				215				220								
Arg	Leu	Glu	Arg	Glu	Arg	Gln	Glu	Arg	Glu	Arg	Glu	Arg	Leu	Glu	Gln	
225					230				235				240			
Leu	Glu	Arg	Glu	Gln	Val	Glu	Trp	Glu	Arg	Glu	Arg	Arg	Met	Ser	Asn	
245				250				255								
Ala	Ala	Pro	Ser	Ser	Asp	Ser	Ser	Leu	Ser	Ser	Ala	Pro	Leu	Pro	Glu	
260				265				270								
Tyr	Ser	Ser	Cys	Gln	Pro	Pro	Ser	Ala	Pro	Pro	Pro	Ser	Tyr	Ala	Lys	
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Val	Ile	Ser	Ala	Pro	Val	Ser	Asp	Ala	Thr	Pro	Asp	Tyr	Ala	Val	Val	
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325				330				335								
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Pro	Ser	Ser	Pro	Val	Asn	Thr	Pro	Ser	Ser	Gln	Pro	Pro	Ala	Ala	Lys	
355				360				365								
Ser	Cys	Ala	Trp	Pro	Thr	Ser	Asn	Phe	Ser	Pro	Leu	Pro	Pro	Ser	Pro	
370				375				380								
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385					390				395				400			
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Pro	Thr	Ala	Pro	Asn	Gly	Ser	Leu	Asp	Ser	Val	Thr	Tyr	Pro	Val	Ser	
420				425				430								
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435				440				445								
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Leu	Ala	Ser	Leu	Ser	His	Cys	Gly	Ser	Gln	Ala	Ser	Pro	Pro	Pro	Gly	
465					470				475				480			
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Ala Pro Pro Pro Pro
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			20					25					30		
Ser	Glu	Asp	Ser	Ser	Leu	Asn	Thr	Asp	Glu	Trp	Glu	Glu	Glu	Lys	Thr
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Glu	Glu	Gln	Pro	Ser	Glu	Val	Asn	Thr	Gly	Pro	Arg	Tyr	Glu	Thr	Ala
		50				55					60				
Arg	Glu	Val	Ser	Ser	Arg	Asp	Ile	Lys	Glu	Leu	Glu	Lys	Ser	Asn	Lys
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Val	Arg	Asn	Thr	Asn	Lys	Ala	Asp	Leu	Ile	Ala	Met	Leu	Lys	Glu	Lys
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Ala	Glu	Lys	Gly	Pro	Asn	Ile	Asn	Asn	Asn	Asn	Ser	Glu	Gln	Thr	Glu
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Asn	Ala	Ala	Ile	Asn	Glu	Glu	Ala	Ser	Gly	Ala	Asp	Arg	Pro	Ala	Ile
		115					120					125			
Gln	Val	Glu	Arg	Arg	His	Pro	Gly	Leu	Pro	Ser	Asp	Ser	Ala	Ala	Glu
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Ile	Lys	Lys	Arg	Arg	Lys	Ala	Ile	Ala	Ser	Ser	Asp	Ser	Glu	Leu	Glu
145					150					155				160	
Ser	Leu	Thr	Tyr	Pro	Asp	Lys	Pro	Thr	Lys	Val	Asn	Lys	Lys	Lys	Val
				165					170					175	
Ala	Lys	Glu	Ser	Val	Ala	Asp	Ala	Ser	Glu	Ser	Asp	Leu	Asp	Ser	Ser
			180				185					190			
Met	Gln	Ser	Ala	Asp	Glu	Ser	Ser	Pro	Gln	Pro	Leu	Lys	Ala	Asn	Gln
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Gln	Pro	Phe	Phe	Pro	Lys	Val	Phe	Lys	Lys	Ile	Lys	Asp	Ala	Gly	Lys
	210				215						220				
Trp	Val	Arg	Asp	Lys	Ile	Asp	Glu	Asn	Pro	Glu	Val	Lys	Lys	Ala	Ile
225					230					235				240	
Val	Asp	Lys	Ser	Ala	Gly	Leu	Ile	Asp	Gln	Leu	Leu	Thr	Lys	Lys	Lys
				245					250					255	
Ser	Glu	Glu	Val	Asn	Ala	Ser	Asp	Phe	Pro	Pro	Pro	Pro	Thr	Asp	Glu
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Glu	Leu	Arg	Leu	Ala	Leu	Pro	Glu	Thr	Pro	Met	Leu	Leu	Gly	Phe	Asn
		275					280					285			
Ala	Pro	Ala	Thr	Ser	Glu	Pro	Ser	Ser	Phe	Glu	Phe	Pro	Pro	Pro	Pro
	290					295					300				
Thr	Asp	Glu	Glu	Leu	Arg	Leu	Ala	Leu	Pro	Glu	Thr	Pro	Met	Leu	Leu
305					310					315				320	
Gly	Phe	Asn	Ala	Pro	Ala	Thr	Ser	Glu	Pro	Ser	Ser	Phe	Glu	Phe	Pro
				325					330					335	
Pro	Pro	Pro	Thr	Glu	Asp	Glu	Leu	Glu	Ile	Ile	Arg	Glu	Thr	Ala	Ser
			340					345					350		
Ser	Leu	Asp	Ser	Ser	Phe	Thr	Arg	Gly	Asp	Leu	Ala	Ser	Leu	Arg	Asn
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Ala	Ile	Asn	Arg	His	Ser	Gln	Asn	Phe	Ser	Asp	Phe	Pro	Pro	Ile	Pro
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Thr	Glu	Glu	Glu	Leu	Asn	Gly	Arg	Gly	Gly	Arg	Pro	Thr	Ser	Glu	Glu
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Phe	Ser	Ser	Leu	Asn	Ser	Gly	Asp	Phe	Thr	Asp	Asp	Glu	Asn	Ser	Glu
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Thr	Thr	Glu	Glu	Glu	Ile	Asp	Arg	Leu	Ala	Asp	Leu	Arg	Asp	Arg	Gly
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Pro	Ser	Gln	Pro	Leu	Asn	Val	Phe	Asn	Lys	Lys	Thr	Thr	Thr	Lys	Thr

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Val	Thr	Lys	Lys	Pro	Thr	Pro	Val	Lys	Thr	Ala	Pro	Lys	Leu	Ala	Glu		
			500					505					510				
Leu	Pro	Ala	Thr	Lys	Pro	Gln	Glu	Thr	Val	Leu	Arg	Glu	Asn	Lys	Thr		
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Pro	Phe	Ile	Glu	Lys	Gln	Ala	Glu	Thr	Asn	Lys	Gln	Ser	Ile	Asn	Met		
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545					550					555					560		
Glu	Met	Lys	Pro	Gln	Thr	Glu	Glu	Lys	Met	Val	Glu	Glu	Ser	Glu	Ser		
				565					570					575			
Ala	Asn	Asn	Ala	Asn	Gly	Lys	Asn	Arg	Ser	Ala	Gly	Ile	Glu	Glu	Gly		
			580				585						590				
Lys	Leu	Ile	Ala	Lys	Ser	Ala	Glu	Asp	Glu	Lys	Ala	Lys	Glu	Glu	Pro		
		595					600					605					
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 <223> Xaa is any amino acid

<400> 6
 Cys Ala Ala Xaa
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 Phe Pro Pro Pro Cys Ala Ala Xaa
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Ala Pro Pro Pro Pro Cys Ala Ala Xaa
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<210> 9

<211> 684

<212> PRT

<213> *Drosophila melanogaster*

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			20					25					30		
Ser	Lys	Val	Gln	Ile	Tyr	His	His	Gln	Gln	Asn	Asn	Thr	Phe	Arg	Val
		35					40					45			
Val	Gly	Arg	Lys	Leu	Gln	Asp	His	Glu	Val	Val	Ile	Asn	Cys	Ser	Ile
	50					55					60				
Leu	Lys	Gly	Leu	Lys	Tyr	Asn	Gln	Ala	Thr	Ala	Thr	Phe	His	Gln	Trp
65					70					75					80
Arg	Asp	Ser	Lys	Phe	Val	Tyr	Gly	Leu	Asn	Phe	Ser	Ser	Gln	Asn	Asp
				85					90					95	
Ala	Glu	Asn	Phe	Ala	Arg	Ala	Met	Met	His	Ala	Leu	Glu	Val	Leu	Ser
			100					105					110		
Gly	Arg	Val	Ala	Asn	Asn	Pro	Gly	Gly	Pro	Pro	Thr	Asn	Gly	Asn	Gly
		115					120					125			
Tyr	Glu	Glu	Asp	Met	Gly	Tyr	Arg	Thr	Met	Thr	Ser	Glu	Asp	Ala	Ala
	130					135					140				
Ile	Leu	Arg	Gln	Asn	Asn	Ser	Ile	Gly	Gly	His	Val	Thr	Pro	Ser	Ala
145					150					155					160
Gln	Thr	Pro	Thr	Ser	Gln	Thr	Asn	Gln	Asn	Asn	Ile	Pro	Gln	Ser	Pro
				165					170					175	
Pro	Thr	Pro	Gln	Gly	His	His	Arg	Thr	Ser	Ser	Ala	Pro	Pro	Ala	Pro
			180					185					190		
Gln	Pro	Gln	Gln	Gln	Gln	Gln	Gln	Gln	Gln	Ala	Gln	Gln	Met	Gly	Gln
		195						200					205		
Pro	Gly	Ser	His	Tyr	Gly	Pro	Thr	Gly	Asn	Gly	Pro	Thr	Ser	Asn	Gly
	210					215					220				
Leu	Pro	Gln	Gln	Val	Asn	Ser	Gln	Ile	Pro	Pro	Ala	Pro	Gln	Gln	Gln
225					230					235					240
Pro	Gln	Gln	Gln	Gln	Phe	Gln	Gln	Gln	Gln	Gln	Gln	Gln	Gln	Tyr	Gln
				245					250					255	
Gln	Met	Val	Gln	Ala	Gly	Tyr	Ala	Pro	Ser	Gln	Gln	Tyr	Gln	Gln	Pro
			260				265						270		
His	Tyr	Val	Leu	Ser	Asn	Ser	Asn	Pro	Asn	Leu	Thr	Val	His	Gln	Tyr
		275					280					285			
Pro	Thr	Gln	Gln	Ala	Gln	Gln	Pro	Pro	Gln	Ala	Pro	Gln	Pro	Pro	
	290					295				300					
Leu	Gln	Asn	Gly	Gly	Met	Tyr	Met	Val	Gly	His	Ser	His	Leu	Pro	Ser
305					310					315					320
Ser	Ala	Ser	Ala	Asn	Ser	Val	Val	Tyr	Ala	Ser	Gln	Gln	Gln	Met	Leu
				325					330					335	
Pro	Gln	Ala	His	Pro	Gln	Ala	Pro	Gln	Ala	Pro	Thr	Met	Pro	Gly	Pro
			340				345						350		
Gly	Tyr	Gly	Gly	Pro	Pro	Val	Pro	Pro	Pro	Gln	Gln	Gln	Ala	Glu	Asn
		355					360					365			
Pro	Tyr	Gly	Gln	Val	Pro	Met	Pro	Pro	Pro	Met	Asn	Pro	Ser	Gln	Gln
	370					375					380				
Gln	Gln	Pro	Gly	Gln	Val	Pro	Leu	Asn	Arg	Met	Ser	Ser	Gln	Gly	Gly
385					390					395					400

Pro Gly Gly Pro Pro Ala Pro Ala Pro Pro Pro Pro Pro Pro Ser Phe
 405 410 415
 Gly Gly Ala Ala Gly Gly Gly Pro Pro Pro Pro Ala Pro Pro Gln Met
 420 425 430
 Phe Asn Gly Ala Pro Pro Pro Pro Ala Met Gly Gly Gly Pro Pro Pro
 435 440 445
 Ala Pro Pro Ala Pro Pro Ala Met Gly Gly Gly Pro Pro Ala Pro
 450 455 460
 Gly Gly Pro Gly Ala Pro Pro Pro Pro Pro Pro Gly Leu Gly
 465 470 475 480
 Gly Ala Pro Lys Lys Glu Asp Pro Gln Ala Asp Leu Met Gly Ser Leu
 485 490 495
 Ala Ser Gln Leu Gln Gln Phe Lys Leu Lys Lys Asn Lys Val Thr Thr
 500 505 510
 Ser Ala Pro Glu Asn Ser Gly Ser Ser Thr Ser Ser Gly Gly Ser Gly
 515 520 525
 Asn Tyr Gly Thr Ile Gly Arg Ser Ser Asn Gly Met Ala Ser Met Met
 530 535 540
 Asp Glu Met Ala Lys Thr Leu Ala Arg Arg Arg Ala Gln Ala Glu Lys
 545 550 555 560
 Lys Asp Pro Asp Pro Glu Ala Glu Val Lys Lys Arg Pro Trp Glu Lys
 565 570 575
 Ser Asn Thr Leu Pro His Lys Leu Ser Gly Gly Ala Gly Ser Gly Ser
 580 585 590
 Ala Gly Ser Gly His Glu Gly Ala Asn Gly Asn Ser Gly Gly Ala Gly
 595 600 605
 Ser Asn Thr Thr Asn Ser Gly Gly Glu Ser Pro Arg Pro Met Arg Lys
 610 615 620
 Arg Phe Gly Ser Ala Ser Glu Glu Thr Ile Leu Lys Val Asn Gly Asp
 625 630 635 640
 Gly Leu Ser Leu Ala Leu Ser Asn Gly Asp Leu Asp Thr Leu Lys Ala
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 Glu Ile Val Arg Glu Met Arg Leu Glu Ile Gln Lys Val Lys Asn Glu
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 Ile Ile Asp Ala Ile Lys Ser Glu Phe Asn Arg Arg
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 35 40 45
 Val Val Gly Arg Lys Met Gln Pro Asp Gln Gln Val Val Ile Asn Cys
 50 55 60
 Ala Ile Val Arg Gly Val Lys Tyr Asn Gln Ala Thr Pro Asn Phe His
 65 70 75 80
 Gln Trp Arg Asp Ala Arg Gln Val Trp Gly Leu Asn Phe Gly Ser Lys
 85 90 95
 Glu Asp Ala Ala Gln Phe Ala Ala Gly Met Ala Ser Ala Leu Glu Ala
 100 105 110
 Leu Glu Gly Gly Gly Pro Pro Pro Pro Pro Ala Leu Pro Thr Trp Ser
 115 120 125

Val	Pro	Asn	Gly	Pro	Ser	Pro	Glu	Glu	Val	Glu	Gln	Gln	Lys	Arg	Gln
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Gln	Pro	Gly	Pro	Ser	Glu	His	Ile	Glu	Arg	Arg	Val	Ser	Asn	Ala	Gly
145				150						155					160
Gly	Pro	Pro	Ala	Pro	Pro	Ala	Gly	Gly	Pro	Pro	Pro	Pro	Pro	Gly	Pro
			165						170					175	
Pro	Pro	Pro	Pro	Gly	Pro	Pro	Pro	Pro	Pro	Gly	Leu	Pro	Pro	Ser	Gly
			180						185					190	
Val	Pro	Ala	Ala	Ala	His	Gly	Ala	Gly	Gly	Gly	Pro	Pro	Pro	Ala	Pro
		195					200					205			
Pro	Leu	Pro	Ala	Ala	Gln	Gly	Pro	Gly	Gly	Gly	Gly	Ala	Gly	Ala	Pro
	210					215					220				
Gly	Leu	Ala	Ala	Ala	Ile	Ala	Gly	Ala	Lys	Leu	Arg	Lys	Val	Ser	Lys
225					230					235					240
Gln	Glu	Glu	Ala	Ser	Gly	Gly	Pro	Thr	Ala	Pro	Lys	Ala	Glu	Ser	Gly
				245					250					255	
Arg	Ser	Gly	Gly	Gly	Gly	Leu	Met	Glu	Met	Asn	Ala	Met	Leu	Ala	
			260					265					270		
Arg	Arg	Arg	Lys	Ala	Thr	Gln	Val	Gly	Glu	Lys	Thr	Pro	Lys	Asp	Glu
			275				280					285			
Ser	Ala	Asn	Gln	Glu	Glu	Pro	Glu	Ala	Arg	Val	Pro	Ala	Gln	Ser	Glu
	290					295					300				
Ser	Val	Arg	Arg	Pro	Trp	Glu	Lys	Asn	Ser	Thr	Thr	Leu	Pro	Arg	Met
305					310					315					320
Lys	Ser	Ser	Ser	Ser	Val	Thr	Thr	Ser	Glu	Thr	Gln	Pro	Cys	Thr	Pro
				325					330					335	
Ser	Ser	Ser	Asp	Tyr	Ser	Asp	Leu	Gln	Arg	Val	Lys	Gln	Glu	Leu	Leu
			340					345					350		
Glu	Glu	Val	Lys	Lys	Glu	Leu	Gln	Lys	Val	Lys	Glu	Glu	Ile	Ile	Glu
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Ala	Phe	Val	Gln	Glu	Leu	Arg	Lys	Arg	Gly	Ser	Pro				
	370					375					380				

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			20					25					30		
Phe	Ser	Arg	Ile	Asn	Ile	Tyr	His	Asn	Thr	Ala	Ser	Ser	Thr	Phe	Arg
		35					40					45			
Val	Val	Gly	Val	Lys	Leu	Gln	Asp	Gln	Gln	Val	Val	Ile	Asn	Tyr	Ser
	50					55					60				
Ile	Val	Lys	Gly	Leu	Lys	Tyr	Asn	Gln	Ala	Thr	Pro	Thr	Phe	His	Gln
65					70					75				80	
Trp	Arg	Asp	Ala	Arg	Gln	Val	Tyr	Gly	Leu	Asn	Phe	Ala	Ser	Lys	Glu
				85					90					95	
Glu	Ala	Thr	Thr	Phe	Ser	Asn	Ala	Met	Leu	Phe	Ala	Leu	Asn	Ile	Met
			100					105					110		
Asn	Ser	Gln	Glu	Gly	Gly	Pro	Ser	Thr	Gln	Arg	Gln	Val	Gln	Asn	Gly
		115					120					125			
Pro	Ser	Pro	Glu	Glu	Met	Asp	Ile	Gln	Arg	Arg	Gln	Val	Met	Glu	Gln
		130				135					140				
Gln	His	Arg	Gln	Glu	Ser	Leu	Glu	Arg	Arg	Ile	Ser	Ala	Thr	Gly	Pro
145					150					155					160


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Ile Leu Pro Pro Gly His Pro Ser Ser Ala Ala Ser Thr Thr Leu Ser
      165      170      175
Cys Ser Gly Pro Pro Pro Pro Pro Pro Pro Pro Pro Val Pro Pro Pro Pro
      180      185      190
Thr Gly Ser Thr Pro Pro Pro Pro Pro Pro Leu Pro Ala Gly Gly Ala
      195      200      205
Gln Gly Thr Asn His Asp Glu Ser Ser Ala Ser Gly Leu Ala Ala Ala
      210      215      220
Leu Ala Gly Ala Lys Leu Arg Arg Val Gln Arg Pro Glu Asp Ala Ser
      225      230      235      240
Gly Gly Ser Ser Pro Ser Gly Thr Ser Lys Ser Asp Ala Asn Arg Ala
      245      250      255
Ser Ser Gly Gly Gly Gly Gly Gly Leu Met Glu Glu Met Asn Lys Leu
      260      265      270
Leu Ala Lys Arg Arg Lys Ala Ala Ser Gln Thr Asp Lys Pro Ala Asp
      275      280      285
Arg Lys Glu Asp Glu Ser Gln Thr Glu Asp Pro Ser Thr Ser Pro Ser
      290      295      300
Pro Gly Thr Arg Ala Thr Ser Gln Pro Pro Asn Ser Ser Glu Ala Gly
      305      310      315      320
Arg Lys Pro Trp Glu Arg Ser Asn Ser Val Glu Lys Pro Val Ser Ser
      325      330      335
Leu Leu Ser Arg Val Lys Pro Ala Gly Ser Val Asn Asp Val Gly Leu
      340      345      350
Asp Ala Leu Asp Leu Asp Arg Met Lys Gln Glu Ile Leu Glu Glu Val
      355      360      365
Val Arg Glu Leu His Lys Val Lys Glu Glu Ile Ile Asp Ala Ile Arg
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Gln Glu Leu Ser Gly Ile Ser Thr Thr
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<210> 12
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<212> PRT
<213> Listeria monocytogenes

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Asp Phe Pro Pro Pro Pro
1      5

```

```

<210> 13
<211> 6
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```

```

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Asp Ala Pro Pro Pro Pro
1      5

```

```

<210> 14
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```

<220>

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<222> (1)...(1)

<223> Xaa is Asp or Glu

<400> 14

Xaa Phe Pro Pro Pro Pro

1

5